

form, even though it was raging as an epidemic in France and Spain in 1884-1885. This immunity may be attributed to the great measures for sewage and refuse removal carried out in Britain, which had slowly resulted in such a purification of the soil as to make it unsuitable for conferring virulence on the micro-organism of cholera.

Among the subjects discussed in the sections were the notification of consumption, the several aspects of sewage disposal, construction of hospitals and public baths, and disinfection.

In addition to the sections, eight technical conferences were held dealing with the aspects of hygiene, particularly in reference to the different professions and various classes of the community.

In connection with the congress an exhibition of sanitary apparatus and appliances was arranged, containing exhibits brought by manufacturers from all parts of the country. The visits made to the various municipal undertakings and sanitary works in the neighbourhood served as a valuable object-lesson, illustrating many of the matters discussed in the meetings of the congress.

Among the exhibits at the exhibition, which were carefully examined by a board of expert judges, a special Rogers Field medal was awarded by the institute to the Northern Vacuum Cleaning Company for their apparatus for cleaning carpets, furniture, and house decorations without removing them from the house. The attendance of members and delegates numbered 1550.

E. WHITE WALLIS.

THE MUSEUMS ASSOCIATION.

THE fourteenth annual congress of the Museums Association was held in Aberdeen on July 13-16, and although the place of meeting was so far north, the attendance was exceptionally good, while the programme of business was one of the most varied and useful that has ever been brought before the Association. The president for this year is Dr. F. A. Bather, assistant keeper of geology, British Museum (Natural History), whose presidential address dealt chiefly with art museums. After defining generally the purport and breadth of museums, which he classified into three divisions, (a) investigation for the benefit of specialists; (b) instruction for the benefit of students; and (c) inspiration for the guidance of the general visitor, he entered into a critical survey of the Museum of Fine Art, specially condemning the present system of arranging pictures, and the lack of harmony between the architecture, decoration, and contents of an art gallery.

Mr. James Murray followed with a paper on the Aberdeen Art Gallery, which is about to be greatly extended; then came a paper by Mr. Alex. M. Rodger, "Method of Mounting Fish with Natural Surroundings," which can be commended to all curators who wish to make their museums attractive. Mr. W. P. Pyecraft was rather severe on some of the methods of representing birds in a museum, and Mr. E. M. Holmes briefly described a method of preserving the natural colours of dried leaves and flowers for museum specimens, which had stood the test of many years' exposure, while a paper by Mr. H. Bolton treated of the "Re-shelving of Museum Cases." "On Good Form in Natural History Museums" was the title of a paper by Mr. F. Jeffrey Bell; another paper of the same character being "Neglect of Opportunities," by Mr. S. S. Buckman.

In addition to representatives from the leading museums of Britain, there were some foreign representatives who read papers. Dr. Jens Thiis, director of the Nordenfjeldske Kunstindustri-museum, Trondhjem, explained the practical work connected with that museum; Dr. G. Johanson Karlin, of the Kulturhistoriske Museum, Lund, gave some good advice in his paper on the museum system; while Dr. O. Lehmann, of the Altona Museum, advocated the cultivation of the habit of drawing in natural history museums.

Other papers were contributed by Prof. T. D. A. Cockerell, of the New Mexico Normal University; Dr. Anton Fritsch, of the Bohemian Museum, Prag; Mr. B. H. Woodward, of the Perth Museum, Western Australia; and Prof. Wm. M. Ramsay, of Aberdeen, who treated of the archaic art of the north-east of Scotland, and the urgent necessity for the preservation of existing examples of it, while Prof. J. Arthur Thomson, in a convincing paper,

showed the need for a faunistic museum for the north of Scotland. All these papers, together with the discussions which they aroused, will be published in due course in the *Museums Journal*. The invitation of the City of Norwich to hold the conference in 1904 in that city was accepted, and Dr. S. F. Harmer, superintendent of the Museum of Zoology, Cambridge, was elected president, Mr. E. Howarth, of the Museum and Art Gallery, Sheffield, being re-elected secretary and editor.

UNIVERSITY AND EDUCATIONAL INTELLIGENCE.

THE third reading of the London Education Bill was carried in the House of Commons on July 22, and the second reading passed the House of Lords on July 28. The measure will, therefore, doubtless soon be placed upon the Statute-book.

THE following awards have been made under the research scheme of the Carnegie Trust for the universities of Scotland, in addition to those announced last week:—*Research Scholarships*.—Pathological: Mr. C. T. Andrew, Mr. A. Matheson, Mr. M. Logan Taylor, Mr. S. A. K. Wilson. Economical: Mr. John Young.

MR. PHILIP J. HARTOG has been appointed academic registrar of the University of London in succession to Dr. H. Frank Heath, and Dr. E. R. Edwards secretary to the registrar of the board to promote the extension of university teaching, in succession to Mr. J. Travis Mills. The Drapers' Company has presented to the university the sum of 1000*l.* to be devoted to the assistance of Prof. Karl Pearson in his statistical researches at University College and in the higher work of his department.

THE Technical Instruction Committee of Leeds has decided to give support to the application of the Yorkshire College for the establishment of a university in Leeds, to be entitled Victoria University of Yorkshire, and, in the event of a Charter being granted, to give 4000*l.* per annum towards the university funds, in addition to the 1550*l.* granted from the "whisky" money. The finance committee also approved of the resolution. The *Gazette* of Friday last announces that a petition has been presented to the King in Council praying that a Charter be granted constituting an independent university in Sheffield.

AMONG many questions of educational interest considered in the report for 1902 of the council of the City and Guilds of London Institute is that of the relation between the amount of State aid for university and higher technical education and that of private munificence for the same purpose. The report states, "that State or public aid does not necessarily take the place of private and voluntary effort is shown by the experience of the United States of America. Notwithstanding the increasing revenue available there from the State land grants permanently assigned to education, the activity and munificence of private effort increases rather than diminishes, as shown by the large contributions which are continually being made to the principal universities and higher colleges. In the three months September to November of last year gifts to higher education, amounting in all to nearly five million dollars, equal to about one million sterling, have been publicly recorded." The report also shows that the executive committee of the institute has had under consideration the question of the length of the sessions of work of colleges providing systematic courses of higher instruction. It has been found that the number of weeks in the session at eight of the principal technical colleges in England varies from thirty-one to thirty-three, leaving between four and five months' vacation during the year. Vacations do not necessarily mean holidays, and in most colleges the work of advanced students continues into the vacations; nevertheless, the committee suggests that the length of the formal session might with advantage be increased.

TWENTY-EIGHT senior county scholarships and exhibitions have just been awarded by the London County Council Technical Education Board. The awards are made on the work and promise of the candidates, and most of the scholars will pursue their studies at universities or advanced

technical colleges. Among the awards we notice the following:—Mabel Gardner, who has gained the first science scholarship at Girton College, senior county scholarship of *gol.* a year for three years. H. H. Mittell, a full senior county scholarship of *gol.* a year for three years to enable him to proceed to Magdalene College, Cambridge, where he has gained an open scholarship, and to take the mathematical tripos. C. H. Pitt, a senior county scholarship of *gol.* a year to enable him to proceed to Corpus Christi College, Cambridge, where he has won an open science scholarship. A. E. Baker, an exhibition of *75l.* a year for two years in the first instance, in order to enable him to proceed to Trinity College, Cambridge, where he has obtained an exhibition and subsizarship, and to take the natural sciences tripos. W. H. Norris, an exhibition of *70l.* a year for three years to enable him to proceed to Corpus Christi College, where he has gained an open science scholarship. J. W. Kuhrt, a free place at the London School of Economics and Political Science, together with an exhibition of *50l.* a year for two years, in order to enable him to take the B.Sc. examination of the London University in economics. B. P. Williams, an exhibition of *50l.* a year for two years, together with a free place at the college to enable him to take the B.Sc. degree in engineering. P. A. Houseman, an exhibition of *40l.* a year for three years to assist him to proceed to Würzburg University for the study of chemistry. H. H. Hodge, an exhibition of *30l.* for one year in order to enable him to travel on the Continent and study the French language and the French system of education.

THE Board of Education has recently published two sets of regulations, for the session 1903-4, for schools of various grades. One volume deals with secondary day schools, and does not appear to differ in any important respect from that of last year. The other contains regulations for all schools and classes in connection with the Board of Education which have not received attention in previous regulations already published for next year's work, such as evening schools, technical institutions, and schools of art and art classes. A circular letter respecting the latter volume has been issued by the Board, and describes for the benefit of managers of schools the important respects in which the regulations for next session differ from those of previous years. The volume may be said to concern all those institutions in which instruction of a specialised or technical character is given, whether in the day-time or in the evening, as well as evening schools and classes the scope of which may vary almost indefinitely with the attainments and aim of the students. The rule under which the rate of grant payable for science instruction given in the day-time was half the rate payable for such instruction if given in the evening is abolished, and grants for advanced instruction given during the day in technical institutions will now be assessed in accordance with regulations appropriate to the special circumstances of such instruction. The letter also urges the desirability of fixed salaries for teachers of classes of all kinds, and rightly insists that the amount of stipend should be in relation to the qualifications and experience of the teacher and the time given by him to the work of the class, and that cognisance should be taken of the time absorbed in preparing experimental lectures, in travelling, and in the correction of home-work. It is very satisfactory, too, to find that the new regulations definitely require a sufficient preliminary training for students in classes in scientific and technical subjects, and that every encouragement is given to managers to inaugurate a system of "courses of study" rather than one of isolated subjects in no way correlated.

SOCIETIES AND ACADEMIES.

LONDON.

Royal Society, June 18.—"On the Synthesis or Fats Accompanying Absorption from the Intestine." By Benjamin **Moore**, M.A., D.Sc., Johnston Professor of Biochemistry at University College, Liverpool. Communicated by Prof. C. S. Sherrington, F.R.S.

The fats of the food are changed in the intestine into fatty acids and glycerine, and the fatty acids are then in part combined with alkali to form soaps.

Both soaps and free fatty acids have a very small solubility in water, and it is by the agency of the bile, in which both are much more soluble, that these constituents of the digested fats are made capable of being taken up in soluble form by the absorbing cells of the intestine.

The absorbed fatty constituents are not taken up by the blood stream, but pass by a separate system, namely, the absorbent lacteals of the intestinal area, to be finally carried to the circulating blood by the main lymphatic vessel, the thoracic duct.

Now, somewhere along the path of absorption, the absorbed soaps and fatty acids are recombined with glycerine to form fats, for in the thoracic duct after a meal containing fat only fats are found.

The seat of this transformation has not hitherto been known with accuracy, but in this paper experiments are quoted to show that the change occurs in the intestinal cells which first take up the constituents of the digested fat in soluble form, and not in the cells of the lymphatic glands of the intestine through which the absorbed fatty matter subsequently passes on its way to the thoracic duct.

This is shown by analyses of the fatty matter in the small lymphatic vessels leading from the intestine, which show that, even here before the absorbed fatty matter has reached the abdominal lymphatic glands, it has all been changed back into fat. A change in the same direction is shown by analyses for fatty constituents of the intestinal cells, but here the process is found in progress, and not yet complete.

It is further shown that the cell must be *in situ* and supplied with nutrient matter in order that this change can be brought about, for no synthesis of fat occurs when the isolated intestinal cell or extracts of it are allowed to act upon the fatty constituents *in vitro*. The only change then occurring is the formation from soap of free fatty acid, which is probably the initial stage in the change occurring in the living intact cell, and is further a protective action, which would prevent the entrance of the poisonous soaps into the circulation.

This demonstrates that the living cell supplied with energy by the nutrient matter which bathes it is capable of acting as an energy transformer for chemical energy, and of carrying out syntheses impossible for enzymes which cannot add energy to the ingredients upon which they act, and hence cannot carry out complex syntheses requiring the addition of chemical energy to those ingredients, as can the living cell.

"The Theory of Symmetrical Optical Objectives." By S. D. **Chalmers**, B.A. (Cantab.), M.A. (Sydney), St. John's College, Cambridge. Communicated by Prof. Larmor, Sec. R.S.

This paper deals with the relations between the aberrations of a lens system, used with a front stop, and those of the compound system formed by two such systems disposed symmetrically with respect to the stop. The results justify the practice of correcting a single component—the back one—for astigmatism and spherical aberration, *provided* due attention is paid to the securing of the condition for no distortion.

PARIS.

Academy of Sciences, July 20.—M. Albert Gaudry in the chair.—The manner of flow of a spreading sheet of water on a plane surface, applied to the case where the surface is curved, by M. J. **Boussinesq**.—On a new method for the detection and estimation of small traces of arsenic, by M. Armand **Gautier**. It is based on the principle that ferric oxide precipitated in the presence of arsenic carries down with it the whole of the latter, even in the presence of chlorides and other salts. The arsenic in the precipitate can then be directly estimated in a Marsh apparatus. In this way the thousand millionth of its weight of arsenic can be detected in a substance, and its presence was shown in the purest distilled water and many common reagents.—On the torsion movements of the eye when looking in certain directions, the socket remaining in the primary position, by M. Yves **Delage**.—On a new action produced by the rays n , and on several facts with regard to these radiations, by M. R. **Blondlot**. The rays n falling on platinum foil heated to dull redness cause it to glow more brightly. This effect is not due to increase of temperature. The increased brilliancy is observed on both sides of the